REMARKS

This invention is directed to a field emitter source and a method of processing same. Claims 1, 4, 6-8, 12-16, 18 and 21, 22 and 25-35 are pending in the application. Claims 29-35 are withdrawn from consideration.

I. CLAIM OBJECTIONS

Claim 22 is objected to as being of improper dependent form for failing to further limit the subject matter of a previous claim. The Office Action states that the claim recites the limitation of "a non-photoresist" that is not further limiting the resins/media in claim 18. The applicants respectfully disagree. Claim 22 recites "wherein said mixing medium is not a photoresist" further limiting the Markush group of the independent claim 22. However, to advance prosecution of this application, claim 22 is canceled without prejudice.

II. THE OBVIOUSNESS REJECTIONS

A. Traverse of the Obviousness Rejection of Claims 1, 4, 6-8 and 12-16

Claims 1, 4, 6-8 and 12-16 are rejected under 35 U.S.C. §103(a) for allegedly being obvious over the Tuck *et al.* patent (WO 02/03413). The Office Action states that Tuck *et al.* teach a field emission device containing an array of field electron emitters formed by printing an ink and making the device by screen printing the ink over a conductive surface forming a field emitter. The Office Action also states that Tuck *et al.* fail to teach the claimed viscosity. The Office Action asserts that it would have been obvious to one of skill in the art to optimize the viscosity of the ink composition of Tuck as a choice of design of the chosen printing means by routine experimentation with reasonable expectation of success, because the prior art teaches the printing of ink by various printing means a process that place the ink in a defined pattern.

Applicants respectfully disagree. As has been acknowledged by the Supreme Court, "[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741, 82 U.S.P.Q.2d 1385, 1396 (2007), quoting In re Kahn, 441 F.3d 977, 988, 78 U.S.P.Q.2d 1329, 1336 (Fed. Cir. 2006). The Tuck *et al.* reference does not teach the addition of silica with carbon black, or a

viscosity of the mixing medium. The applicants have discussed the importance of the viscosity with respect to the consistency of the field emission properties (paragraph 28 of the original specification). Furthermore, the applicants have discussed the role of silica in the composition (see paragraph 41 of the original specification). The Tuck reference discloses fumed silica as a second particle when the first particle is graphite (see paragraph [0040]). The Tuck reference also teaches that the first particles may be graphite and the second particles may be carbon blacks (paragraph [0039]). Therefore, Tuck *et al.* do not teach a composition with both a quantity of silica and a quantity of carbon black. In order for a person of skill in the art to arrive at the claimed invention, they would have to ignore the teaching of Tuck *et al.* that the composition comprises graphite plus carbon black, or graphite plus fumed silica, and combine carbon black and silica without graphite. The Office Action has not provided any rational underpinning to support the conclusion of obviousness.

B. Traverse of the Obviousness Rejection of Claims 1, 4-8 and 12-16

Claims 1, 4, 6-8 and 12-16 are rejected under 35 U.S.C. §103(a) for allegedly being obvious over the Tuck *et al.* patent in view of Blanchet-Fincher *et al.* (US 5,948,465). The Office Action states that the prior art fails to teach the source of carbon black and the viscosity. The Office Action asserts that it would have been obvious to one of skill in the art to substitute the carbon black in the composition of Tuck with carbon black from other sources with reasonable expectation of success, because the carbonaceous electron emitters were well known in the art at the time of the invention as shown by the teachings of Blanchet-Fincher.

Applicant respectfully disagrees. For the reasons described above, the Tuck *et al.* reference does not teach all of the elements of the claimed invention. In particular the Tuck *et al.* reference does not teach a composition comprising a quantity of carbon black **and** a quantity of silica dispersed in a mixing medium. Regardless of what the Blanchet-Fincher reference teaches, the combined references, do not teach or suggest all of the elements of the claimed invention, arranged as in the claim. For at least this reason the applicants respectfully request that the obviousness rejection of claims 1, 4, 6-8 and 12-16 be withdrawn.

B. Traverse of the Obviousness Rejection of Claims 18 and 21-28

Claims 18 and 21-28 are rejected under 35 U.S.C. §103(a) for allegedly being obvious over the Tuck *et al.* patent in view of Blanchet-Fincher *et al.* (US 5,948,465). The Office Action states

that Tuck fails to teach the measuring of the field emitter properties per claim 18. The Office Action relies on Blanchet-Fincher to teach measuring the field emitter properties as a function of applied voltage. The Office Action asserts that it would be obvious to measure the properties of the field emitter during the process of making the composition as routine quality control function of the process control to optimize the process steps as shown by Blanchet-Fincher.

Applicant respectfully disagrees. Claim 18 has been amended to include the limitation of "adding additional carbon black if the formulation does not have desired vertical resistance." Support for this amendment is found in the original specification for example at paragraph [41]. No new matter enters by way of this amendment. As has been acknowledged by the Supreme Court, "[r]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *KSR Int'l Co. v. Teleflex, Inc.*, 127 S. Ct. 1727, 1741, 82 U.S.P.Q.2d 1385, 1396 (2007), quoting In re Kahn, 441 F.3d 977, 988, 78 U.S.P.Q.2d 1329, 1336 (Fed. Cir. 2006). The Blanchet-Fincher reference teaches the emission current being measured as a function of applied voltage. These measurements were done to test the emissivity of the different carbon emitters. The present invention teaches and claims measuring the vertical resistance of the formulation in order to adjust the carbon black content. The Office Action asserts that it would be obvious to one of skill in the art to measure various process parameters and properties **including** the vertical resistances of the field emitter. However, the Blanchet-Fincher reference does not teach measuring vertical resistance, nor do they teach evaluating the formulation to see if the formulation has reached a particular desired conductivity threshold, hence adjusting the carbon black content. The Office Action has made the conclusory statement that testing emissivity is analogous to testing vertical resistance for adjusting the carbon black amount and has not provided any support for that statement. Applicants respectfully request that the obviousness rejections of claims 18 and 21-28 be withdrawn.

D. Traverse of the Obviousness Rejection of Claims 1, 4, 6-8, 12-15, 18, 22, and 25-28

Claims 1, 4, 6-8, 12-15, 18, 22 and 25-28 are rejected under 35 U.S.C. §103(a) for allegedly being obvious over the Ma *et al.* (2005/0224764) in view of Tuck and Blanchet-Fincher *et*

al. The Office Action states that Ma *et al.* teach the composition of electroconductive ink. The Office Action further states that the Ma *et al.* reference fails to teach the addition of silica particles in the composition. The Office Action relies on the Tuck and Blanchet-Fincher *et al.* references to teach silica as rheology modifiers. The Office Action asserts that it would have been obvious to a person of skill in the art to include rheology modifiers in the ink composition of Ma *et al.* to benefit improved rheology of the ink with reasonable expectation of success, because Ma is suggestive of incorporating rheology modifiers.

The applicants respectfully disagree. The Ma *et al.* reference teaches an electroconductive ink comprising carbon fibrils or nanotubes. Applicant reasserts that the Ma *et al.* teaches away from using carbon black as the field emitter, as stated in the Backgound section of their specification. Additionally, the Ma *et al.* reference teaches polymeric binders for changing the rheology of the inks. The Tuck reference teaches silica as a rheology modifier only with respect to CHTR (controllable high thickness reduction) inks. One of skill in the art, in order to arrive at the claimed invention, would have had to ignore the teaching of Ma *et al.* with respect to rheology modifiers, and select silica from a nonanalogous type of ink. Applicants respectfully request that the rejections of claims 1, 4, 6-8, 12-15, 18, 22 and 25-28 under 35 U.S.C. §103(a) be withdrawn.

CONCLUSION

The application is considered in good and proper form for allowance, and the Examiner is respectfully requested to pass this application to issue. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned representative.

Respectfully submitted,

By Thomas Omholt

Thomas Omholt (Reg. No. 37,052)
(630) 375-2033